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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/779,799

02/18/2004

Harumi Suzuki

01-553

9628

23400

7590

10/19/2006

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EXAMINER

RAABE, CHRISTOPHER M

ART UNIT

PAPER NUMBER

2879

DATE MAILED: 10/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/779,799

Applicant(s)

SUZUKI ET AL.

Examiner

Christopher M. Raabe

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,6-9,11,13-15,17-19,21,23 and 35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,6-9,11,13-15,17-19,21,23 and 35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

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DETAILED ACTION

1. Submission filed July 31, 2006 has been entered and acknowledged by the examiner.
2. Objection to drawings in Office Action sent March 10, 2006 has been withdrawn.
3. Applicant's arguments filed July 31, 2006 have been fully considered but they are not persuasive.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
5. Claims 17-19,21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 17 recites the limitation "The display panel according to claim 16" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1,2,4,6-9,11,13-15,17-19,21,23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuda (USPN 20030044639) in view of Bulovic et al. (USPN 6312836).

With regard to claim 1,

Fukuda discloses an organic electroluminescence display panel comprising: a hole transport layer (42 of fig 5); and a luminescent layer disposed on the hole transport layer (43 of fig 5), and an electron transport layer disposed on that luminescent layer (44 of fig 5) wherein the luminescent layer includes at least first and second luminescent layers, wherein the first and second luminescent layers are repeatedly arranged on the hole transport layer so as to be adjacent each other (43R, 43G of fig 5), wherein the first luminescent layer includes a first dopant for emitting a first light having a first wavelength, and the second luminescent layer includes a second dopant for emitting a second light having a second wavelength, which is shorter than the first wavelength (paragraph 98, and table 1), wherein no first dopant is disposed between the hole transport layer and the second luminescent layer (43G, 43R of fig 5) wherein the hole transport layer includes a plurality of parts of the hole transport layer (42R,42G of fig 5), wherein the parts of the hole transport layer include at least first and second

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part hole transport layers, which correspond to the first and second luminescent layers, respectively (42R, 42G of fig 3) and wherein both of the first luminescent layer and the first part hole transport layer are independent from the second luminescent layer and the second part hole transport layer (42R, 42G, 43R, 43G of fig 5) wherein the electron transport layer is made of an electron transporting material having an ionization potential, and wherein the hole transporting material in the one of the first and second luminescent layers has another ionization potential (44,42 of fig 5) which is 0.2 eV lower than that of the electron transporting material in the electron transport layer (table 1) wherein the electron transport layer includes a plurality of parts of the electron transport layer (44R, 44G, 44B of fig 5), wherein the parts of the electron transport layer include at least first and second part electron transport layers, which correspond to the first and second luminescent layers, respectively (44R, 44G of fig 3) and wherein both of the first luminescent layer and the first part hole transport layer are independent from the second luminescent layer and the second part hole transport layer (44R, 44G, 43R, 43G of fig 5).

Fukuda does not disclose the host material of the luminescent layers. However, hole transporting materials were well known and widely used by those of ordinary skill in the art at the time of the invention as excellent host material for a luminescent layer in an organic electroluminescence display panel, as evidenced by Bulovic et al. (column 6, lines 50-55), and hence would have been obvious to incorporate into the display panel of Fukuda in order to simplify manufacture.

With regard to claim 2,

Fukuda discloses the display panel, further comprising: a substrate (2 of fig 5); an anode layer (3 of fig 5); and a cathode layer (5 of fig 5), wherein the anode layer, the hole transport

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layer, the luminescent layer, the electron transport layer and the cathode layer are disposed on the substrate in this order (fig 5).

With regard to claim 4,

Fukuda discloses the display panel, further comprising: a hole injection layer disposed between the anode layer and the hole transport layer (41 of fig 3).

With regard to claim 6,

Fukuda discloses the display panel, wherein one of the first and second luminescent layers and one part of the hole transport layer corresponding to the one of the first and second luminescent layers are independent from the other one of the first and second luminescent layers and the other one part of the hole transport layer corresponding to the other one of the first and second luminescent layers so that no dopant of the other one of the first and second luminescent layers is disposed between the one part of the hole transport layer and the one of the first and second luminescent layers (43G, 42G, 43R, 42R of fig 5).

With regard to claim 7,

Fukuda discloses the display panel. The phrase "wherein the first luminescent layer is formed with using a time-sharing method before the second luminescent layer is formed" does not structurally distinguish the claimed invention from the prior art, as is require of apparatus claims (MPEP 2114).

With regard to claim 8,

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Fukuda discloses the display panel, wherein the luminescent layer further includes a third luminescent layer (43B of fig 5), which includes a third dopant for emitting a third light having a third wavelength (paragraph 98, and table 1), wherein the first light is a red light, the second light is a green light, and the third light is a blue light, and wherein the first, second and third luminescent layers are repeatedly arranged on the hole transport layer so as to be adjacent together (43R, 43G, 43B of fig 5).

With regard to claim 9,

Fukuda discloses the display panel, wherein no first dopant is disposed between the electron transport layer and the second luminescent layer (43R, 43G, 44G of fig 5).

With regard to claim 11,

Fukuda discloses the display panel, further comprising: a hole injection layer disposed between the anode layer and the hole transport layer (41 of fig 3).

With regard to claim 13,

Fukuda discloses the display panel, wherein one of the first and second luminescent layers and one part of the electron transport layer corresponding to the one of the first and second luminescent layers are independent from the other one of the first and second luminescent layers and the other one part of the hole transport layer corresponding to the other one of the first and second luminescent layers so that no dopant of the other one of the first and second luminescent layers is disposed between the one part of the electron transport layer and the one of the first and second luminescent layers (44R, 43R, 44G, 43G of fig 5).

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With regard to claim 14,

Fukuda discloses the display panel. The phrase "wherein the second luminescent layer is formed on the hole transport layer with using a time-sharing method before the first luminescent layer is formed on the hole transport layer" does not structurally distinguish the claimed invention from the prior art, as is require of apparatus claims (MPEP 2114).

With regard to claim 15,

Fukuda discloses the display panel, wherein the luminescent layer further includes a third luminescent layer (43B of fig 5), which includes a third dopant for emitting a third light having a third wavelength (paragraph 98, and table 1), wherein the first light is a red light, the second light is a green light, and the third light is a blue light, and wherein the first, second and third luminescent layers are repeatedly arranged on the hole transport layer so as to be adjacent together (43R, 43G, 43B of fig 5).

With regard to claim 17,

Fukuda discloses the display panel, further comprising: a substrate (2 of fig 5); an anode layer (3 of fig 5); and a cathode layer (5 of fig 5), wherein the anode layer, the hole transport layer, the luminescent layer, the electron transport layer and the cathode layer are disposed on the substrate in this order (2,3,42,43,44,5 of fig 5), and wherein the first luminescent layer includes a first dopant for emitting a first light having a first wavelength, and the second luminescent layer includes a second dopant for emitting a second light having a second wavelength, which is shorter than the first wavelength (paragraph 98, and table 1).

With regard to claim 18,

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Fukuda discloses the display panel, wherein the hole transporting material of the one of the first and second luminescent layers is disposed at an interface between the other one of the first and second luminescent layers and the hole transport layer (42R, 43R, 42G, 43G of fig 5).

With regard to claim 19,

Fukuda discloses the display panel, wherein the interface further includes an electron transporting material (44 of fig 5) for composing the other one of the first and second luminescent layers (table 1).

With regard to claim 21,

Fukuda discloses the display panel, wherein the luminescent layer further includes a third luminescent layer (43B of fig 5), which includes a third dopant for emitting a third light having a third wavelength (paragraph 98, and table 1), wherein the first light is a red light, the second light is a green light, and the third light is a blue light, and wherein the first, second and third luminescent layers are repeatedly arranged on the hole transport layer so as to be adjacent together (43R, 43G, 43B of fig 5).

With regard to claim 23,

Fukuda discloses the display panel, wherein both of the first and second luminescent layers are made of the electron transporting material as a host material (table 1).

8. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuda (as above), Bulovic et al. (as above) and Kido et al. (USPN 5792567).

With regard to claim 35,

Fukuda discloses an electroluminescence display panel comprising: a hole transport layer (42 of fig 5), a luminescent layer disposed on the hole transport layer (43 of fig 5), a substrate (2 of fig 5), an anode layer (3 of fig 5); an electron transport layer (44 of fig 5); and a cathode layer (5 of fig 5), wherein the anode layer, the hole transport layer, the luminescent layer, the electron transport layer, and the cathode layer are disposed on the substrate in this order (3,43,42,44,5 of fig 5), wherein the luminescent layer includes at least first and second luminescent layers (42R, 42G of fig 5), wherein the first and second luminescent layers are repeatedly arranged on the hole transport layer so as to be adjacent to each other (43R,43G of fig 5), the first luminescent layer, the second luminescent layer and the electron transport layer are disposed independently (43R,43G,44R,44G of fig 5), wherein the first luminescent layer includes a first dopant for emitting a first light having a first wavelength, and the second luminescent layer includes a second dopant for emitting a second light having a second wavelength, which is shorter than the first wavelength (paragraph 98, and table 1), wherein the electron transport layer is made of an electron transporting material having an ionization potential and includes first and second electron transport layer which are sandwiched between the cathode layer and the luminescent layer (44R,44G, 43R,43G and 5 of fig 5), wherein the hole transporting material has another ionization potential, which is 0.2 eV lower than that of the electron transporting material in the first electron transport layer (table 1).

Fukuda does not disclose the host material of the luminescent layers. However, hole transporting materials were well known and widely used by those of ordinary skill in the art at the time of the invention as excellent host material for a luminescent layer in an organic electroluminescence display panel, as evidenced by Bulovic et al. (column 6, lines 50-55), and

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hence would have been obvious to incorporate into the display panel of Fukuda in order to simplify manufacture.

Fukuda does not disclose a second electron transport layer disposed on a first electron transport layer disposed on a luminescent layer wherein the first electron transport layer is a hole blocking layer. However, having multiple electron transport layers which function as hole blocking layers wherein successive layers are disposed on previous layers was well known to those of ordinary skill in the art at the time of the invention, as evidenced by Kido et al. (example 1), to enhance light-emitting characteristics, and hence would have been obvious to incorporate into the device of Fukuda.

Response to Arguments

9. While the applicant argues that table 1 of Fukuda does not disclose a hole transport material having an ionization potential 0.2 eV lower than that of the electron transport material, the examiner asserts that the hole transport material disclosed in table 1, TPD (which has an ionization potential of 5.4 eV), has an ionization potential 0.2 eV lower than that of the electron transport material of table 1, Alq (which has an ionization potential of 5.6 eV).

Regarding the applicant's request for evidence that the use of a hole transport material as a host material for a light emitting layer was a practice well known to and widely used by those of ordinary skill in the art at the time of the invention, the examiner has provided this evidence through the Bulovic et al. reference above.

Additionally, while the applicant argues that the Fukuda does not disclose first and second hole transport, luminescent, and electron transport layers, the first layers corresponding to each other and the second layers corresponding to each other, the first layers being

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independent from the second layers, the examiner asserts that these features are disclosed by Fukuda (42,43,44 R and 42,43,44 G of fig 5).

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Raabe whose telephone number is 571-272-8434. The examiner can normally be reached on m-f 7am-3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CR


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PRIMARY EXAMINER